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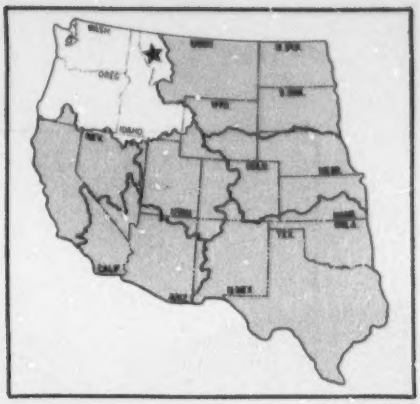
Bitter Root Project

Montana: Ravalli County

Pacific Northwest Region
Bureau of Reclamation



Facilities to serve the land in the Bitter Root Project were constructed originally by private interests. The Bureau of Reclamation was authorized in 1930 to rehabilitate the irrigation system and to liquidate its indebtedness.

The project provides irrigation water for 16,665 acres of benchlands surrounding the town of Stevensville on the east side of the Bitterroot River[1] in west-central Montana. Project facilities include a storage dam and reservoir, a diversion dam, and a distribution system.

PLAN

Water is stored in Lake Como on Rock Creek, one of the west side tributaries of Bitterroot River. Rock Creek Diversion Dam, 1 mile below Lake Como, diverts water into the Bitter Root Irrigation District Canal. A feeder canal from Lost Horse Creek enters the main canal about a mile below the diversion dam, from which point the water flows northerly along the upper edge of the benchlands, generally parallel to and east of the Bitterroot River. The rehabilitated distribution system serves the project lands which lie between the canal and the river.

Como Dam

Completed in 1910 by local irrigators and rehabilitated on its crest and upstream face by the Bureau of Reclamation in 1954, this semihydraulic earthfill dam is 70 feet high and contains 1,114,000 cubic yards of earth and rock. In 1976, the district built concrete protection walls on each side of the spillway section up to elevation 4249.0, the same elevation as the crest of the dam. Under the Safety of Dams Program, designs for the walls were furnished to the district to correct low points in the dam fill adjacent to the spillway. The reservoir, Lake Como, is on Rock Creek about 5 miles northwest of Darby and 15 miles south of Hamilton, Mont. The total capacity of Lake Como is 36,900 acre-feet.

[1]The official name of the river is Bitterroot; the official name of the project and irrigation district is Bitter Root.

Diversion Dam and Canal System

Rock Creek Diversion Dam is a rockfill structure with timber sheet piling diaphragm and is 10.5 feet high. The canal has an initial capacity of 330 cubic feet per second and is 60 miles long. There is also a 7-mile-long feeder canal that diverts water from Lost Horse Creek and delivers it into the district canal about a mile below Rock Creek Diversion Dam. Extensive rehabilitation to the main canal, flumes, siphons, and distribution system was completed during 1963-67. On June 15, 1974, floods damaged Siphon No. 1 on the main canal and the supporting steel trestle crossing the Bitterroot River. The damage was repaired and water deliveries were resumed. Some 77 miles of laterals complete the distribution system.

DEVELOPMENT

Early History

In 1805, when Lewis and Clark passed through the Bitterroot Valley, they found the Flathead Indians living there. In 1841, Catholic missionaries came to the valley and established St. Mary's Mission near the town of Stevensville. The missionaries were responsible for creating interest in the production of crops and livestock. Later, the development of mining, construction of the main line of the Northern Pacific Railway, and establishment of logging camps throughout nearby timber areas created a demand for agricultural products. A thriving community was well established by 1883.

By treaty dated July 16, 1855, and ratified on March 8, 1859, the Flathead Indians agreed to move from the Bitterroot Valley to the Jocko Valley. By passage of the act of June 5, 1872, the Congress provided for relocation of the Indians to the Jocko Reservation and for the survey and settlement of 15 townships in the Bitterroot Valley.

Investigations

Following the agreements with the Indians, the Bitterroot

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(From Project Data Book)

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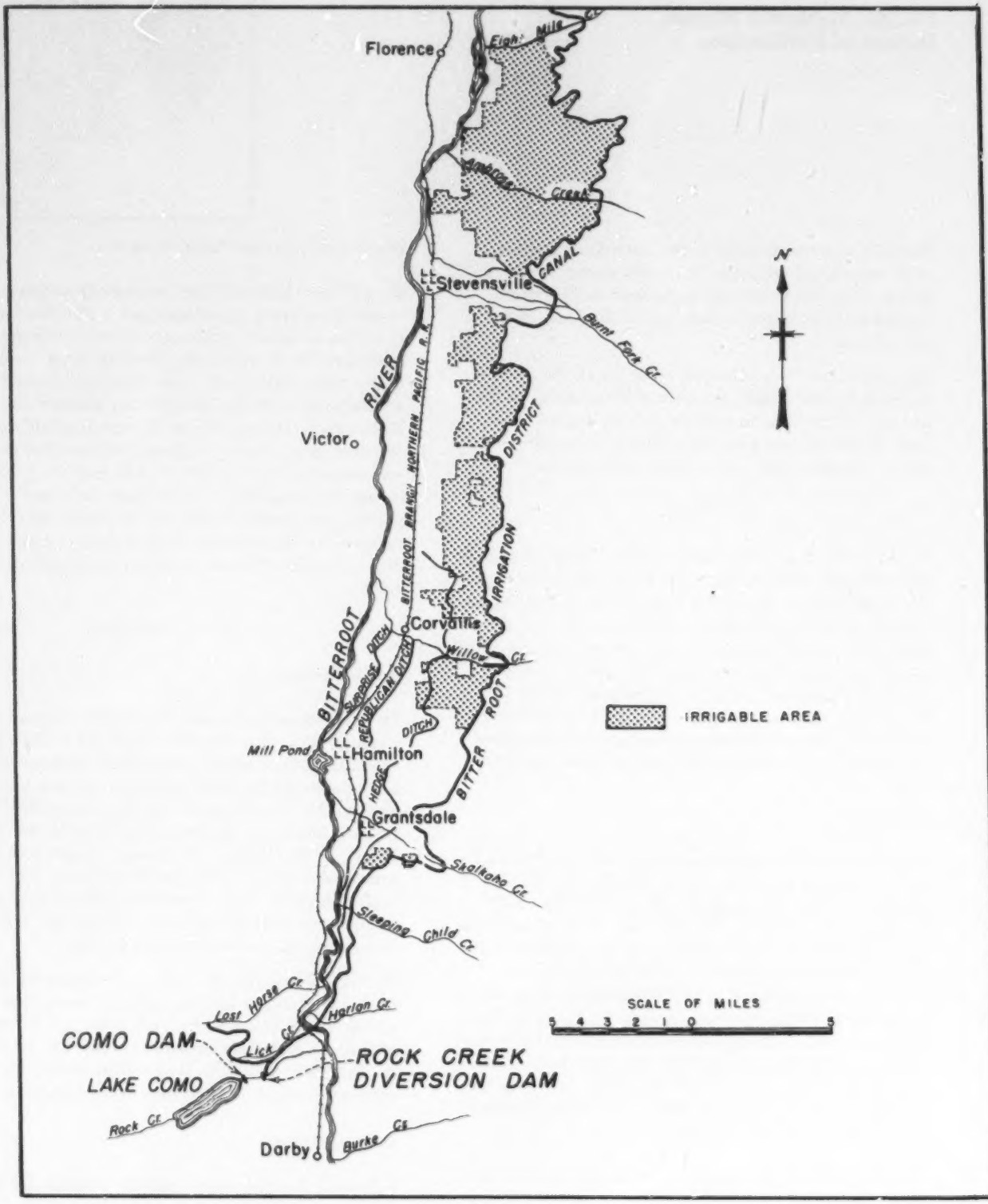
Florence
Eight Mile Cr.
Ambrose Creek
Stevensville
CANAL
Burnt Fork Cr.
RIVER
BITTERROOT BRANCH, NORTHERN PACIFIC R.R.
Victor
DISTRICT
IRRIGATION
Corvallis
Willow Cr.
BITTERROOT
Supreme Ditch
Republican Ditch
Mill Pond
Hamilton
HEDGE DITCH
BITTER ROOT
Grantsdale
Skalkaho Cr.
Sleeping Child Cr.
Lost Horse Cr.
Harlan Cr.
COMO DAM
Lick Cr.
ROCK CREEK
DIVERSION DAM
LAKE COMO
Rock Cr.
Darby
Burke Cr.
N
IRRIGABLE AREA
SCALE OF MILES
5 4 3 2 1 0 5

Como Dam and Lake

Valley experienced many stages of irrigation development which made use of Lake Como and involved rather large-scale construction on the east side of the valley.

In 1920, following a period of generally unsatisfactory irrigation promotion, financial maneuvering, and reorganization, the Bitter Root Irrigation District was formed in accordance with Montana law. In 1923, the district issued bonds to purchase water rights and storage and distribution works.

The district experienced difficulty in retiring its debts, and in 1930 the Congress authorized measures to be undertaken by the Bureau of Reclamation to liquidate the indebtedness, to rehabilitate the project structures, and to loan funds to the district for construction, betterment, or repair work necessary to place the project in good operating condition.

Authorization

Rehabilitation of the irrigation system of the Bitter Root Irrigation District and the liquidation of its private indebtedness were originally authorized by the act of July 3, 1930 (46 Stat. 852). Major rehabilitation of the project facilities was authorized under the Rehabilitation and Betterment Act of October 7, 1949 (63 Stat. 724). Flood damage in 1974 was repaired under the Emergency Fund Act of June 26, 1948 (62 Stat. 1052).

Construction

The project was originally constructed by the Bitter Root Valley Irrigation Company between 1908 and 1910; the Bureau of Reclamation rehabilitated the project beginning in 1930. Additional funds for rehabilitation work were provided in 1936, 1948, and 1956.

Extensive rehabilitation to the canal and distribution system was initiated in 1963 and completed in 1967. Using emergency funds provided by Reclamation, the flood damage of June 15, 1974, was repaired within a few weeks. This work was performed by a contractor hired by the irrigation district. In 1976, the district constructed protective walls on each side of the spillway section with its own funds.

Operating Agency

The Bitter Root Irrigation District maintains and operates the project.

BENEFITS

Irrigation

Principal crops produced are grain, hay, and pasture.

Recreation

Lake Como is in a beautiful setting in the Bitterroot National Forest. Cabin sites are available through the Forest Service. The reservoir and immediate area are used for camping, picnicking, swimming, and boating, and there is fishing for native and rainbow trout.

PROJECT DATA

Land Areas (1980)

Irrigable area:		
Full irrigation service	16,665	acres
Number of irrigated farms	479	

Area Irrigated and Crop Value

Year	Area irrigated, acres	Crop value, dollars
1968	16,316	770,063
1969	16,110	691,171
1970	16,248	798,590
1971	16,192	823,394
1972	16,350	998,120
1973	16,120	1,307,651
1974	14,350	1,092,702
1975	16,298	1,223,930
1976	14,933	1,230,722
1977	15,680	1,508,093
1978	15,684	1,677,579
1979	15,510	2,049,027
1980	15,484	2,488,810

Facilities in Operation

Storage dams[2]	1	
Diversion dams	1	
Canals	67	mi
Laterals	77	mi

[2]Rehabilitated by the Bureau of Reclamation.

Climatic Conditions (1966-80)

Annual precipitation	13.2	in
Temperature:		
Maximum	103	°F
Minimum	—38	°F
Mean	46	°F
Growing season	149	days
Elevation of irrigable area	3500.0	ft

Settlement

Number of persons served with project water (1980):	
Farm irrigation service	2,516
Other water service[3]	1,000
Total	3,516

[3]Urban and suburban, residential, commercial, and industrial lands.

ENGINEERING DATA

Water Supply

ROCK CREEK

Drainage area above Lake Como	54.6	mi²
Annual discharge (1966-80):		
Maximum (1972)	170,500	acre-ft
Minimum (1977)	49,300	acre-ft
Average	94,800	acre-ft
Average annual diversions by project (1966-80)	93,100	acre-ft

Storage Facilities

COMO DAM

Type: Semihydraulic earthfill		
Location: On Rock Creek, about 15 mi south of Hamilton, Mont.		
Construction period: 1908-10. Reclamation rehabilitated crest and upstream face in 1954.		
Reservoir, Lake Como:		
Average annual inflow, 1966-80	94,800	acre-ft
Total capacity to El. 4242.7	36,900	acre-ft
Active capacity, El. 4188.5 to 4242.7	35,100	acre-ft
Surface area at El. 4242.7	980	acres
Dimensions:		
Structural height	70	ft
Hydraulic height	58.7	ft
Top width	25	ft
Maximum base width	400	ft
Crest length	2,550	ft
Crest elevation	4249.0	ft
Total volume	1,114,000	yd³
Spillway: Concrete-lined crest and channel; open cut at left abutment with removable stoplog control.		
Crest length	75	ft
Crest elevation	4236.85	ft
Outlet works: Concrete conduit through base of dam controlled by one 5.5-ft-diameter gate valve for service and one for emergency.		

Diversion Facilities

ROCK CREEK DIVERSION DAM[4]

Type: Timber sheet piling, concrete weir cap, rockfill
Location: On Rock Creek, about 15 mi south of Hamilton, Mont.
Year completed: 1950
Dimensions:

Structural height	10.5	ft
Hydraulic height	4.5	ft
Crest length	80	ft
Crest elevation (assumed)	4060	ft
Volume	600	yd^3
Diversion capacity	330	ft^3/s

Headworks: Concrete, three 48-in-square steel slide gates.

[4]Dam replaced timber-crib weir constructed in 1910.

Carriage Facilities

BITTER ROOT IRRIGATION DISTRICT CANAL

Location: From Rock Creek Diversion Dam on Rock Creek about 15 mi south of Hamilton, Mont., generally north along east side of Bitterroot River to a point about 5 mi northeast of Florence, Mont.
Construction period: 1907-10

Length	72	mi
Diversion capacity	330	ft^3/s

Typical maximum section in earth:

Bottom width	22	ft
Side slopes	1.5:1	
Water depth	5.25	ft

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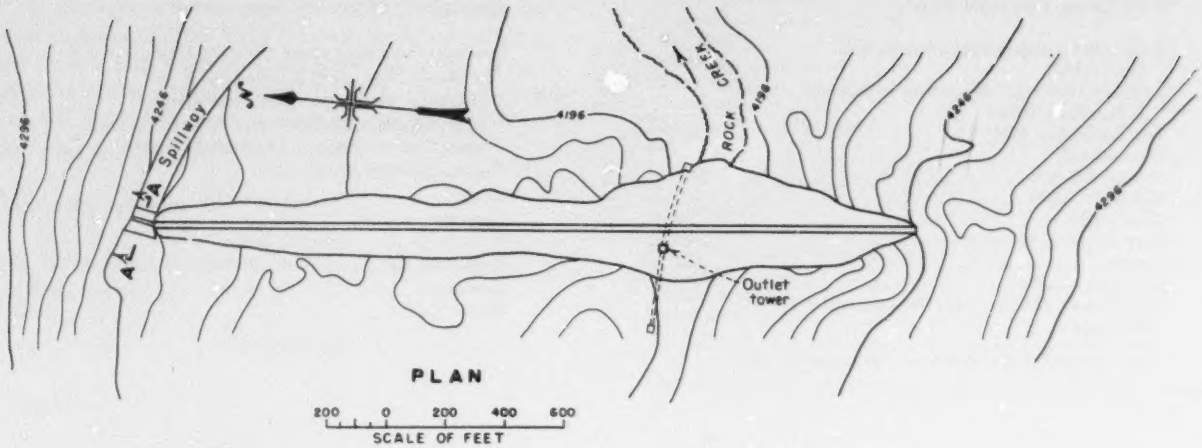
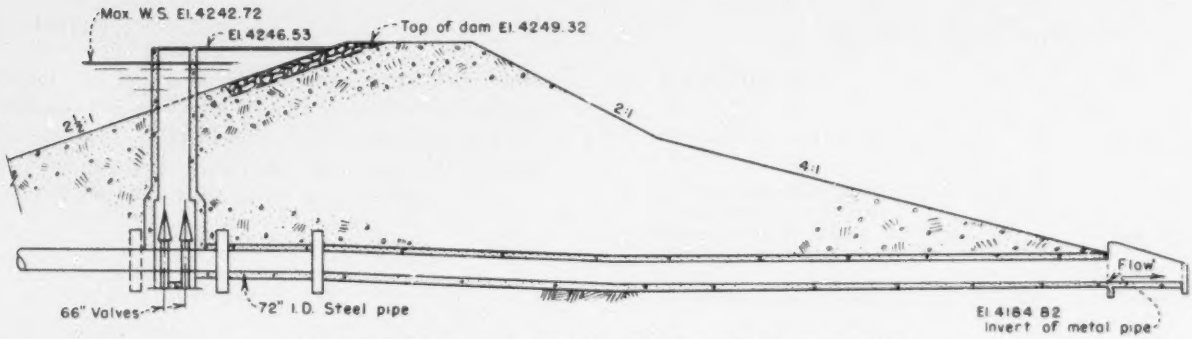
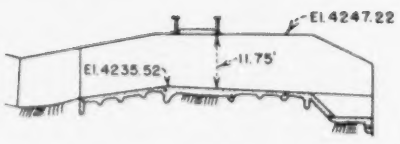
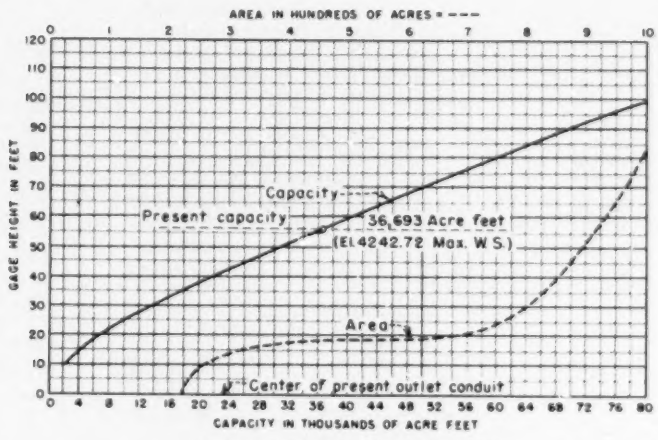




MAXIMUM SECTION AND PROFILE ON ℄ OUTLET WORK



SPILLWAY - SECTION A-A



AREA - CAPACITY - CURVES

Como Dam, Plan and Sections

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